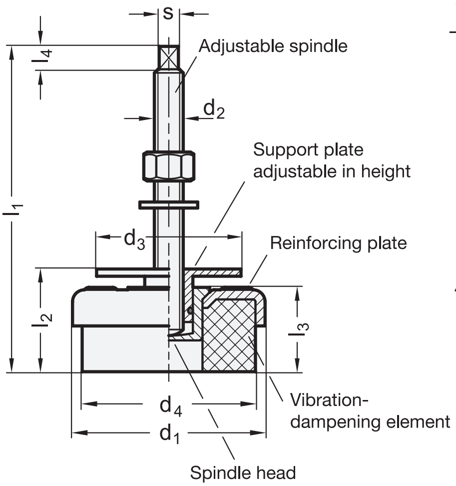
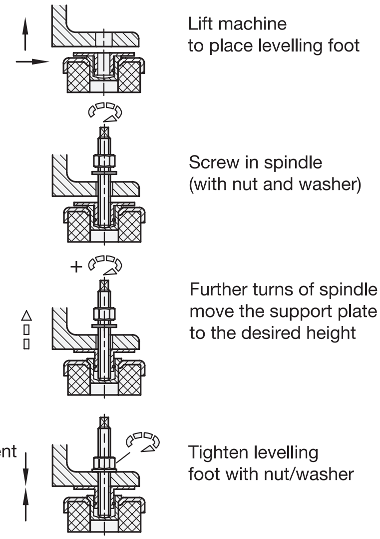
GN 248 Levelling feet

with vibration dampening





ELESA original design LW.A

1 d_1	2 d_2	3 l_1	d_3	d_4	l_2 min.	max.	l_3	l_4	s Square	Static load in N	Stiffness in N/mm	max. compression in mm
80	M 12 x 1,25	134	60	72	38	50	35	10	7	5000	2500	2
120	M 16 x 1,5	150	80	109	45	58	41	10	9	10000	4000	2,5
160	M 20 x 1,5	192	100	150	55	70	48	10	12	20000	9000	2,2
200	M 20 x 1,5	206	130	186	65	80	60	10	12	40000	15000	2,7

Specification

- Vibration dampening element
  Natural rubber NR
  - 80 Shore A
  - black
- Reinforcing plate
  Spindle head
  Support plate
  Steel zinc plated, blue passivated
- Adjustable spindle Steel
  - Tensile strength class 5.8
  - zinc plated, blue passivated
- Hexagon nut ISO 4032
  Steel zinc plated
- *Elastomer characteristics → Page 1483*
- RoHS compliant

Information

Levelling feet GN 248 with dampening element made of rubber are used to dampen vibrations (oscillations) and shock movements.

This has a positive influence on the life of a machine and helps to abate noise.

Using the details on the maximum static load F, the maximum permissible compression and the resulting stiffness, the achievable degree of insulation can be determined with the help of the method shown on page 921.

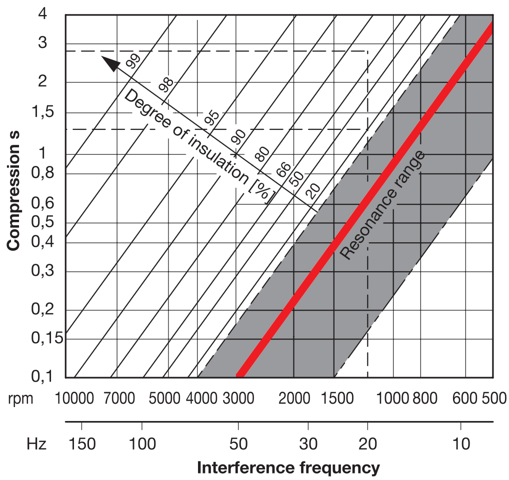
The details relating to the load bearing capacity are non-binding recommended values and rule out any liability. They constitute no general warranty of quality and condition. The user must determine from case to case whether a product is suitable for the intended use.

How to order

GN 248-120-M16x1,5-150 (1 = 120, 2 = M16x1,5, 3 = 150)

1	d_1
2	d_2
3	l_1

Degree of insulation chart



Definitions

Interference frequency [Hz]:
is the frequency emanating from a machine, e.g. from the machine main shaft speed [rpm].

Static load F [N]:
is the load acting on each vibration-dampening element (levelling foot).

Degree of insulation [%]:
measure for absorbing the interference frequency (dampening).

Compression s [mm]:
is the change in the height of the dampening element (spring excursion).

Stiffness R [N/mm]:
is the load causing the dampening element to be compressed by 1 mm (spring rate).

Determining the suitable levelling foot and the achievable degree of insulation

The first step is to determine the static load F for each levelling foot. With favourably arranged levelling feet and therefore an evenly distributed load F, this value is calculated using the following equation:

$$\frac{\text{Force due to weight of the machine [N]}}{\text{Number of levelling feet}} = \text{static load F [N] / for each levelling foot}$$

Use the calculated static load F to select a levelling foot from the table, making sure that the static load F lies as close as possible to the static load capacity without exceeding it. The associated stiffness R of the selected levelling foot is also taken from the table.

The actual compression is then calculated using the equation below:

$$\frac{\text{Static load F [N] / per levelling foot}}{\text{Stiffness R [N/mm]}} = \text{actual compression s [mm]}$$

Starting from the calculated actual compression s, the achievable degree of insulation as factor of the interference frequency can now be taken from the graph shown above.

To optimise the achievable degree of insulation, the number of levelling feet may be changed such that the static load F for each foot is as close as possible below a load capacity value given in the table.

This will increase the compression s which, in turn, results in a higher degree of insulation.

In general it can be said that medium to high frequencies can be very well insulated with sufficient compression.

Example

Static load F (machine weight) = 48,000 N, number of feet = 4, ergo: static load per foot = 12,000 N

Selected foot: d_1 = 160, static load capacity 20,000 N, R = 9,000 N/mm

Resulting in an actual compression s of: $\frac{\text{12,000 N (static load/foot)}}{\text{9,000 N/mm (stiffness R)}} = \text{1.3 mm}$

With an interference frequency of 20 Hz (1,200 rpm), the above graph delivers a degree of insulation of only about 20 %.

To optimise, the number of feet may be increased to 5, resulting in a static load per foot of 9,600 N. A levelling foot whose static load capacity is closer to the new result may now be selected.

Newly selected foot: d_1 = 120, static load capacity 10,000 N, R = 4,000 N/mm

This results in an actual compression s of: $\frac{\text{9,600 N (static load/foot)}}{\text{4,000 N/mm (stiffness R)}} = \text{2.4 mm}$

With the same interference frequency of 20 Hz (1,200 rpm), the above graph now delivers a degree of insulation of approx. 75 %.